COVER SHEET

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TITLE:
Draft Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement, Richland, Benton County, Washington (DOE/EIS-0286D)

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ABSTRACT:

The Draft Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement (HSW EIS) provides environmental and technical information concerning the U.S. Department of Energy (DOE) proposal to enhance waste management practices at the Hanford Site. DOE issued the Notice of Intent to prepare the EIS on October 27, 1997, and held public meetings during the scoping period that extended through January 30, 1998. The HSW EIS updates analyses of environmental consequences from previous documents and provides evaluations for activities that may be implemented as a result of DOE decisions on the Waste Management Programmatic Environmental Impact Statement (WM PEIS). Waste types considered in the HSW EIS include operational low-level radioactive waste (LLW), mixed low-level waste (MLLW), and post-1970 transuranic (TRU) waste. MLLW contains chemically hazardous components in addition to radionuclides. Alternatives for management of these wastes at the Hanford Site, including the alternative of No Action, are analyzed in detail. The LLW and MLLW alternatives are evaluated for a range of waste volumes, representing quantities of waste that could be managed at the Hanford Site as a result of the WM PEIS records of decision. A single maximum forecast volume is evaluated for TRU waste. The No Action Alternative considers continuation of ongoing waste management practices at the Hanford Site or ceasing operations when the limits of existing capabilities are reached. The No Action Alternative provides for indefinite storage of some waste types. The other alternatives evaluate enhanced waste management practices including treatment and ultimate disposal of most wastes. The environmental consequences of the alternatives are generally similar. The major differences occur with respect to the consequences of disposal versus indefinite storage and with respect to the range of waste volumes managed under the alternatives. The draft EIS is being issued for public review and comment, after which DOE will prepare the final EIS. Dates, times, and locations for public meetings will be announced in the *Federal Register* and local media. A record of decision will be published in the *Federal Register* no sooner than 30 days after distribution of the final EIS.

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Units of Measure

The principal units of measurement used in this Environmental Impact Statement (EIS) are SI units, an abbreviation for the International System of units, a metric system accepted by the International Organization of Standardization as the legal standard at a meeting in Elsinore, Denmark, in 1966. In this system, most units are made up of combinations of six basic units, of which length in meters, mass in kilograms, and time in seconds are of most importance in the EIS.

Numerical (Scientific or Exponential) Notation

Numbers that are very small or very large are often expressed in scientific or exponential notation as a matter of convenience. For example, the number 0.000034 may be expressed as 3.4×10^{-5} or 3.4E-05 and 65,000 may be expressed as 6.5×10^{4} or 6.5E+04. In the EIS, numerical values less than 0.001 or greater than 9999 are generally expressed in exponential notation.

Multiples or sub-multiples of the basic units are also used. A partial list of prefixes that denote multiples and sub-multiples follows, with the equivalent multiplier values expressed in scientific and exponential notation:

Name	Symbol	Value Multiplied by:		
atto	a	0.000000000000000001	or 1×10^{-18}	or 1E-18
femto	f	0.000000000000001	or 1×10^{-15}	or 1E-15
pico	p	0.000000000001	or 1×10^{-12}	or 1E-12
nano	n	0.000000001	or 1×10^{-9}	or 1E-09
micro	ì	0.000001	or 1×10^{-6}	or 1E-06
milli	m	0.001	or 1×10^{-3}	or 1E-03
centi	c	0.01	or 1×10^{-2}	or 1E-02
kilo	k	1,000	or 1×10^{3}	or 1E+03
mega	M	1,000,000	or 1×10^{6}	or 1E+06
giga	G	1,000,000,000	or 1×10^{9}	or 1E+09
tera	T	1,000,000,000,000	or 1×10^{12}	or 1E+12

The following symbols are occasionally used in conjunction with numerical expressions:

< less than

≤ less than or equal to

> greater than

≥ greater than or equal to

Basic Units and Conversion Table

Unit of Measure	English Unit	Symbol	Metric Unit	Symbol
Length	inches	in	centimeters	cm
	feet	ft	meters	m
	yards	yd	kilometers	km
	miles	mi		
Area	square feet	ft^2	square meters	m^2
	acres	ac	hectares	ha
	square miles	mi^2	square kilometers	km^2
Volume (dry)	cubic feet	ft^3	cubic meters	m^3
	cubic yards	yd^3		
Volume (liquid)	gallons	gal	liters	L
Mass	ounces	oz	grams	g
	pounds	lb	kilograms	kg
Concentration	parts per million	ppm	grams per liter	g/L
Radioactivity	curies	Ci	becquerels	Bq
Radiation Absorbed Dose	rad	rad	Gray	Gy
Radiation Effective Dose Equivalent	rem	rem	Sievert	Sv
Temperature	degrees Fahrenheit	°F	degrees Centigrade	°C

Base Unit	Multiply By	To Obtain	Base Unit	Multiply By	To Obtain
in	2.54	cm	cm	0.394	in
ft	0.305	m	m	3.28	ft
yd	0.914	m	m	1.09	yd
mi	1.61	km	km	0.621	mi
ft^2	0.093	m^2	m^2	10.76	ft^2
ac	0.405	ha	ha	2.47	ac
mi^2	2.59	km^2	km^2	0.386	mi^2
ft^3	0.028	m^3	m^3	35.3	ft^3
yd^3	0.765	m^3	m^3	1.31	yd^3
gal	3.77	L	L	0.265	gal
oz	28.349	g	g	0.035	oz
lb	0.454	kg	kg	2.205	lb
ppm	0.001	g/L	g/L	1000	ppm
Ci	3.7×10^{10}	Bq	Bq	2.7×10^{-11}	Ci
rad	0.01	Gy	Gy	100	rad
rem	0.01	Sv	Sv	100	rem
°F	(°F - 32) x 5/9	°C	°C	(°C x 9/5) + 32	°F

Summary

This Draft *Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement* (HSW EIS) provides environmental and technical information concerning the U.S. Department of Energy (DOE) proposal to enhance waste management practices at the Hanford Site near Richland, Washington (Figure S.1). The HSW EIS tiers from the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (WM PEIS, DOE 1997a) and addresses local decisions needed to implement the WM PEIS records of decision (RODs). It also updates previous environmental reviews prepared for waste management operations at the Hanford Site. The HSW EIS is being prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 USC 4321 *et seq.*), the DOE implementing procedures for NEPA (10 CFR 1021), and the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500-1508).

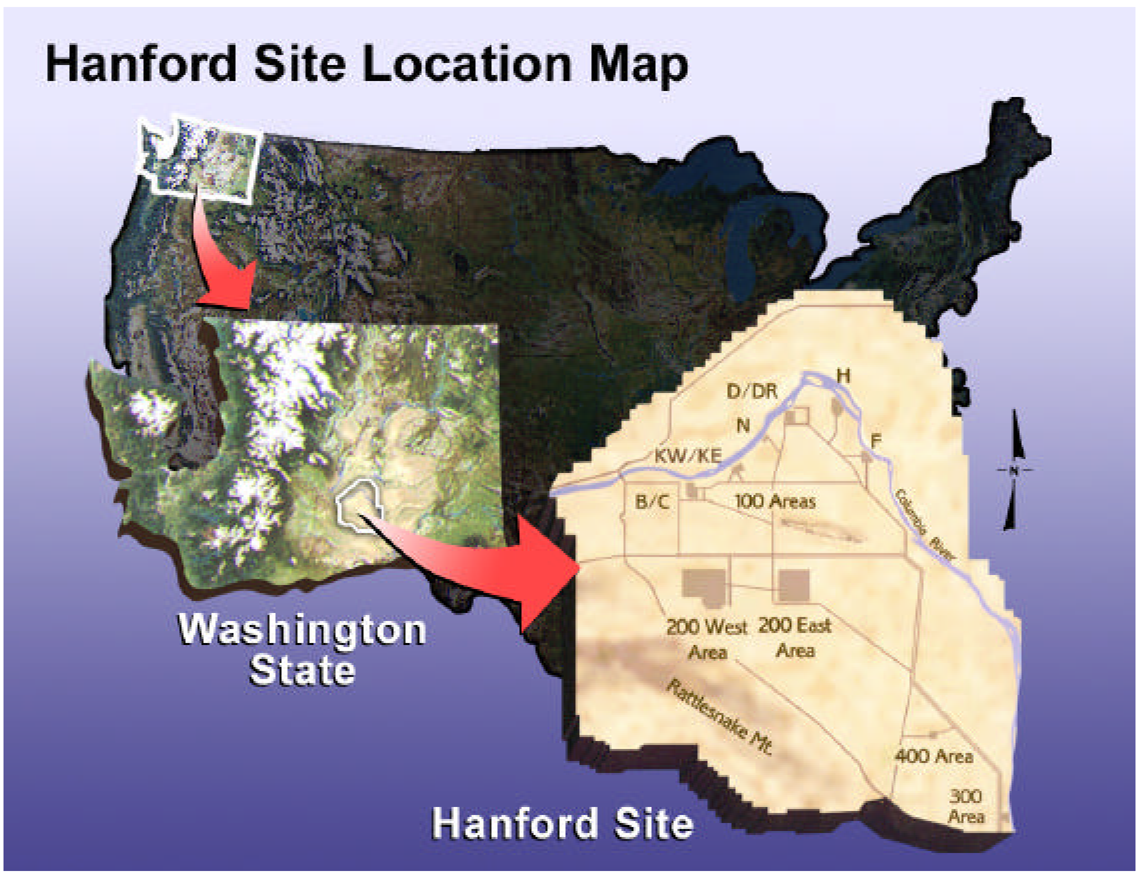

Figure S.1. Hanford Site Location Map

S.1 Introduction

DOE and its predecessors, the Manhattan Project, the U.S. Atomic Energy Commission (AEC), and the U.S. Energy Research and Development Administration (ERDA), have operated the Hanford Site since the 1940s. From the beginning through the 1980s, the primary mission at Hanford was to produce nuclear materials for national defense programs. Defense-materials production at Hanford has now ceased, and the Site's current activities include research, environmental restoration, and waste management. This HSW EIS describes the environmental consequences of alternatives for constructing, modifying, and operating facilities to manage low-level waste (LLW), mixed low-level waste (MLLW), and post-1970 transuranic (TRU) waste at Hanford.

Hanford solid waste program operations include three major functions of storage, treatment, and disposal. Waste from onsite and offsite generators is stored until it can be transferred to an appropriate treatment or disposal facility. DOE and other federal and state regulators monitor storage facilities to evaluate compliance with regulatory requirements. Treatment of these wastes may include volume reduction, destruction or neutralization of non-radioactive hazardous constituents, stabilization, and encapsulation. Disposal facilities at Hanford accept LLW and MLLW. After a previous NEPA analysis (DOE 1997b), DOE decided to dispose of TRU waste at the Waste Isolation Pilot Plant (WIPP) in New Mexico, a deep geologic repository that meets the requirements of 40 CFR 191 (63 FR 3623).

S.2 Purpose and Need

DOE needs to enhance and expand management of its current and anticipated volumes of solid LLW, MLLW, and post-1970 TRU waste at the Hanford Site and to make decisions that will enable the Site to provide storage, treatment, and disposal capabilities for these wastes.

S.3 Scoping

To determine the scope of the issues to be addressed in the EIS, DOE issued a notice of intent (NOI) to prepare the EIS (62 FR 55615). Comments and recommendations from interested parties on the range of actions, alternatives, and impacts that should be considered were requested. At the request of the State of Oregon, the initial public scoping period was subsequently extended (62 FR 65254). DOE held public scoping meetings during which DOE representatives presented an overview of the proposed actions and anticipated scope of the EIS. Four individuals provided oral comments at the public meetings, and eight individuals submitted written comments during the public scoping period. Many of the comments concerned the relationship of the HSW EIS to other DOE waste-management activities, including the WM PEIS (DOE 1997a) and the *Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement* (DOE 1997b). Other comments concerned the need to understand the impacts of shipping offsite waste to Hanford; the use of commercial disposal facilities; and the need to address environmental, socioeconomic, and transportation impacts in the HSW EIS. DOE considered all of the comments received in its development of this draft HSW EIS.

DOE originally intended to evaluate the management of hazardous waste in the HSW EIS. However, DOE issued the final WM PEIS (DOE 1997a) and, based on that document, a ROD for the management of hazardous waste across the DOE complex (63 FR 41810). In its decision, DOE announced that it would continue the current practice of managing non-radioactive hazardous waste at commercial treatment and disposal facilities. Because no further decision is necessary regarding the management of non-radioactive hazardous waste at Hanford, this waste type was removed from the scope of the HSW EIS.

The environmental analyses in the HSW EIS were conducted through the year 2046, which represents the end of most waste management operations at the Site. Some activities that would occur after 2046, such as closure of the Low Level Burial Grounds (LLBGs), were also evaluated. This operational period was chosen for assessment, rather than the 20-year period evaluated in the WM PEIS (and as stated in the HSW EIS NOI), to provide a more complete evaluation of the consequences of waste management operations at Hanford. Certain environmental consequences, such as the long-term impacts of waste disposal on groundwater and the Columbia River, were evaluated for 10,000 years after the end of operations.

Other public comments and DOE programmatic decisions have resulted in restructuring the HSW EIS alternatives relative to those initially presented in the NOI. In the final WM PEIS (DOE 1997a), DOE selected a preferred alternative that provided for consolidated management of LLW and MLLW at a few major facilities across the DOE complex. The ROD for MLLW and LLW (65 FR 10061) identified Hanford Site and the Nevada Test Site as regional management facilities for these waste types. For management of post-1970 TRU waste, DOE decided that each site would prepare and certify waste generated at that site for ultimate disposal at WIPP (63 FR 3629).

Three sets of alternative actions are considered in the EIS for each waste type, consistent with the WM PEIS decisions. In very general terms, one set of activities represents continuation of current waste management practices without enhancements or implementation of many activities currently planned to meet legal or regulatory requirements. These activities comprise the No Action Alternatives, and they represent the baseline against which the proposed activities can be compared. The other alternatives represent the activities DOE might undertake to manage anticipated wastes consistent with the WM PEIS decisions.

Within each of the LLW and MLLW alternatives, a range of waste volumes was evaluated to reflect uncertainties in future waste receipts at the Hanford Site. In general, the lower bound volume for each waste type consists primarily of waste from Hanford Site generators, with a relatively small proportion of waste from other DOE sites. The upper bound volume includes additional offsite waste that Hanford could potentially receive as a result of the WM PEIS decisions to designate Hanford a regional disposal site for LLW and a regional treatment and disposal site for MLLW. For TRU waste, a single volume was evaluated corresponding to the maximum forecast receipts because substantial volumes of offsite TRU waste are not expected at Hanford.

S.4 Waste Types Analyzed

The types of waste managed by the solid waste program and evaluated in this draft HSW EIS include LLW, MLLW, and post-1970 TRU waste. Waste streams associated with each waste type are shown in Figure S.2. In the context of this document, a waste stream is defined as a collection of wastes with physical and chemical characteristics that will generally require the same management approach (that is, using the same storage, treatment, and disposal capabilities). Radioactive waste may also be classified as either contact-handled (CH) or remote-handled (RH).

Contact-Handled and Remote-Handled Waste

Contact-handled waste containers produce radiation dose rates less than or equal to 200 millirem/hr at the container surface. RH waste containers produce dose rates greater than 200 millirem/hr. CH containers can be safely handled by direct contact using appropriate health and safety measures. RH containers require special handling or shielding during waste management operations.

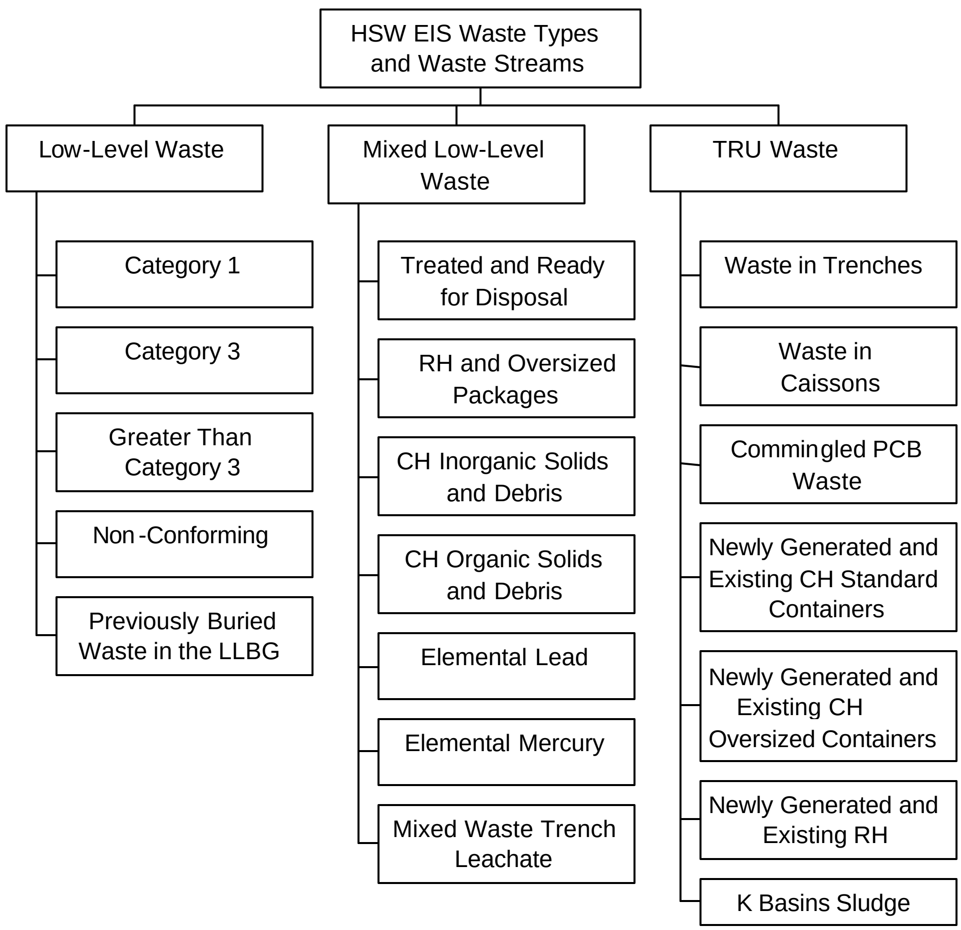

Figure S.2. Waste Types and Waste Streams Considered in the HSW EIS

Other programs at Hanford manage other types of materials, such as wastes from environmental restoration (site cleanup) activities, high-level radioactive waste, spent nuclear fuel, and wastes generated during building decontamination and decommissioning. These materials managed by other Hanford programs are not included within the scope of this EIS.

Low-Level Waste. LLW is waste that contains radioactive material and that does not fall under any other DOE classification of radioactive waste. DOE manages LLW and other radioactive waste under the authority of the Atomic Energy Act (AEA) of 1954 (42 USC 2011 *et seq*.). At Hanford, LLW is further divided into categories, depending on the type and quantity of radioactive material that it contains. Categories of LLW and other requirements for disposal of LLW at Hanford are described in the *Hanford Site Solid Waste Acceptance Criteria* (HSSWAC) established by the DOE Richland Operations office (DOE-RL) and the Hanford waste management contractor, Fluor Hanford, Inc. (FH 2001).

LLW at Hanford was generated during operation of analytical and research laboratories, reactors, chemical separation facilities, plutonium processing facilities, and waste management facilities. LLW typically consists of personal protective equipment, plastic sheeting, gloves, and other operating and laboratory wastes. Ongoing operations at Hanford continue to generate LLW. In addition, several other DOE sites currently send LLW to Hanford.

At present, most LLW is sent directly to the LLBGs for burial. A fraction of the waste is sent to the Waste Receiving and Processing Facility (WRAP) for characterization and verification before burial in the LLBGs. Waste that does not meet the HSSWAC is stored until it can be treated to permit final disposal.

Waste Definitions

Low-level waste is defined as radioactive waste, including accelerator-produced waste, that is not high-level waste, spent nuclear fuel, transuranic waste, or byproduct material (as defined under the Atomic Energy Act).

Mixed low-level waste is LLW that contains both radionuclides subject to the Atomic Energy Act of 1954, and a hazardous component subject to the Resource Conservation and Recovery Act.

Transuranic waste is defined as waste, other than high-level radioactive waste, that contains radionuclides with atomic numbers greater than that of uranium (92) and half-lives greater than 20 years, in concentrations greater than 100 nanocuries per gram of waste.

Mixed Low-Level Waste. MLLW is LLW that also contains non-radioactive hazardous constituents as defined by the Resource Conservation and Recovery Act (RCRA) of 1976 (42 USC 6901 *et seq*.) and applicable state regulations. The hazardous components of MLLW are so identified either because they contain specific listed materials; were generated during specific processes; or exhibit properties such as toxicity, corrosivity, ignitability, or reactivity that could present a hazard to human health and the environment.

MLLW was generated during facility maintenance, deactivation activities, and laboratory operations. MLLW typically consists of sludges, ashes, resins, paint wastes, soils, and other debris. Ongoing operations continue to generate MLLW. Until 1987, MLLW was managed in the same manner as LLW. Beginning in 1987, treatment of MLLW (generally immobilization, removal, or destruction of the hazardous components) was required before it could be sent to a RCRA-permitted land disposal facility.

At Hanford, MLLW is stored at the Central Waste Complex (CWC) or the T Plant Complex awaiting treatment or disposal. DOE currently characterizes and treats limited quantities of MLLW at WRAP and the T Plant Complex. Onsite treatment capabilities include amalgamation of mercury, neutralization of alkaline and acid waste, solidification of liquids, and macroencapsulation. DOE also has contracts with a commercial treatment facility to provide stabilization of inorganic solids, macroencapsulation of debris waste, and thermal treatment of some MLLW. MLLW that has been treated is currently disposed of in RCRA-permitted trenches in the 200 West Area. The MLLW trenches are constructed with a low permeability liner and a system for collecting any water that drains through the waste (referred to as leachate).

Post-1970 Transuranic Waste. TRU waste was produced during reactor operations, fuel reprocessing, and nuclear weapons production. Some TRU waste also resulted from development, production, and utilization of mixed oxide fuels at Hanford. Plutonium is the most common TRU element in waste from DOE facilities. Waste that contains a sufficiently high concentration of TRU radionuclides to meet the regulatory definition of TRU waste must be disposed of in a facility that meets U.S. Environmental Protection Agency (EPA) requirements (40 CFR 191). TRU waste must be characterized, packaged, and certified at Hanford as meeting the WIPP waste acceptance criteria before it can be shipped to that facility for disposal.

TRU waste was not defined as a separate waste type until 1970 and was managed in the same manner as LLW before that time. From 1970 through 1984, Hanford waste suspected of containing TRU radionuclides was retrievably stored in the LLBGs in trenches or in caissons (underground structures intended for storage of some higher activity waste). This waste is referred to as suspect TRU waste because only some of the stored waste contains TRU radionuclides at concentrations specified in the definition. DOE is determining whether suspect TRU waste should be retrieved and processed as TRU waste, or whether it can remain disposed of in the LLBGs. Since 1985, TRU waste has generally been stored in surface facilities, such as CWC or the T Plant Complex, until it can be processed and certified for disposal at WIPP.

Under current plans, newly generated and retrievably stored TRU waste would be sent to WRAP for processing and certification. At the present time, no commercial facilities are available for processing TRU waste. TRU waste that cannot be processed and certified onsite would be stored until treatment becomes available. DOE currently plans to dispose of certified TRU waste at WIPP.

S.5 Solid Waste Management Activities and Facilities

The waste management activities and facilities included within the scope of the draft HSW EIS are described briefly in the following sections. Hanford solid waste program activities include storage, treatment, and disposal of LLW and MLLW, as well as storage and processing of post-1970 TRU waste. Figure S.3 provides an overview of ongoing activities. Existing and proposed waste management facilities considered in this HSW EIS alternatives are also described.

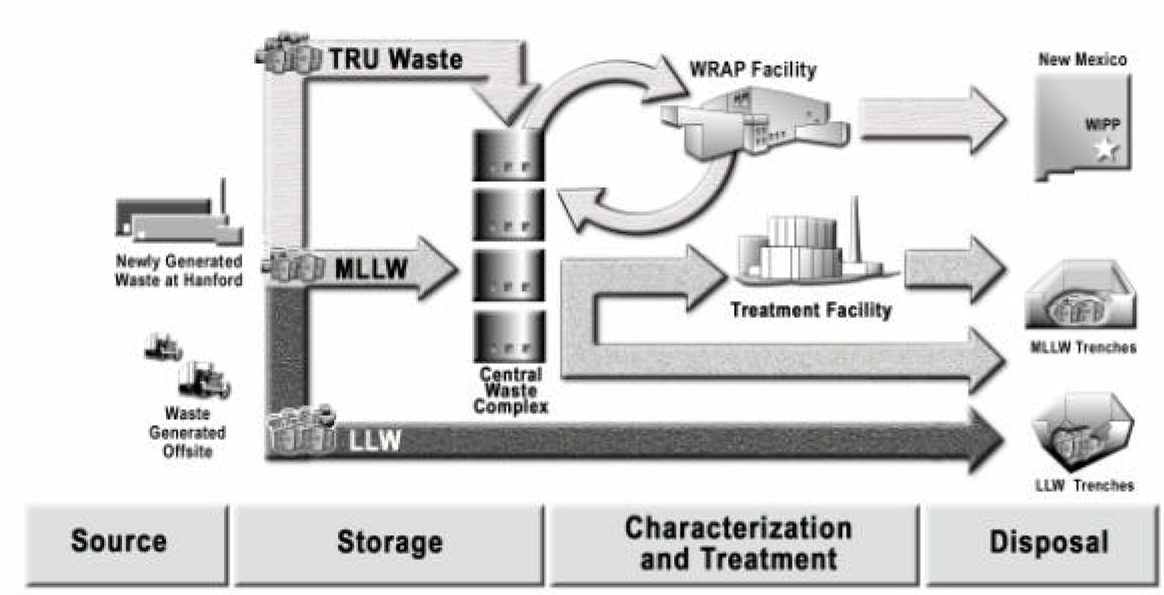

Figure S.3. Overview of Current Hanford Solid Waste Program

S.5.1 Solid Waste Storage

Waste is generally stored while awaiting treatment or disposal. The specific storage methods used depend on the chemical and physical characteristics of the waste as well as the type and concentration of radionuclides in the waste.

> ***Storage Facilities***
>
> Existing Facilities
> Central Waste Complex
> LLBGs
> - Trenches
> - Caissons
>
> T Plant Complex
> WRAP
>
> New/Modified Facilities
> Additional CWC Buildings

At Hanford, waste is stored at either aboveground facilities or belowground. The primary Hanford waste storage facility is the CWC, a group of enclosed metal buildings on concrete pads that are used to store various types of waste awaiting verification, treatment, or disposal. Some waste is also stored outdoors on concrete pads if the outer containers are corrosion-resistant and suitable for such storage. The LLBGs consist of a series of below-grade trenches intended for ultimate disposal of LLW. In some cases, waste has been stored in LLBG trenches or in caissons for later retrieval and disposition, as described in the following sections. The T Plant Complex and WRAP also have some waste storage capabilities.

LLW is typically not stored for an extended period at Hanford. In most cases, a small fraction of each incoming shipment is stored until it can be inspected and verified that it meets the HSSWAC. The remainder is sent directly to the LLBGs for disposal. Trenches in the LLBGs are then backfilled with soil and maintained to prevent the spread of radioactive contamination.

Because the Hanford Site currently does not have facilities to treat all types of MLLW, untreated waste must be stored until it can be treated in compliance with RCRA and state regulations. Short-term storage for MLLW is provided at many generator facilities throughout the Hanford Site for up to 90 days, the maximum allowed in a non-permitted storage facility. Storage of MLLW for longer than 90 days requires a RCRA-permitted storage facility that is engineered to prevent release of the wastes to the environment. Structures at CWC are constructed to meet these requirements, and they provide interim storage for MLLW until it can be treated. A small quantity of MLLW that has been prepared for disposal may also be stored in the LLBG in RCRA-permitted MLLW trenches.

From 1970 to 1988, drums and boxes of TRU waste were placed in storage in LLBG trenches. Small containers of RH TRU waste were also placed within four cement-lined caissons. The caissons are thick-walled concrete structures located in the LLBGs and intended to provide containment and shielding for the waste. Most TRU waste generated after 1988 is stored at CWC until it can be repackaged, as needed, and certified for shipment to WIPP.

Most alternatives evaluated in this HSW EIS would not involve construction of new storage facilities. However, some alternatives would require additional storage for wastes that could not be prepared for final disposal, in which case the CWC would be expanded as necessary.

S.5.2 Solid Waste Treatment

Waste treatment processes are used to change the physical, chemical, or biological characteristics of waste, to reduce its volume, or to make it safer for disposal. Treatment is not required for most LLW but may consist of volume reduction or other activities needed to stabilize the waste.

MLLW requires treatment to specific standards defined by RCRA and state regulations before it can be disposed of in a permitted facility. The Hanford Site has limited capability to treat MLLW, and DOE has contracted with a RCRA-permitted commercial facility to begin treating limited quantities of stored CH MLLW. The 200 Area Effluent Treatment Facility (ETF) treats Hanford Site liquid wastes, including leachate collected from the MLLW trenches. Hanford requires additional capabilities to treat MLLW that cannot be accepted by commercial facilities, such as oversized items or containers and RH MLLW.

TRU waste may also require processing before it can be sent for disposal. Processing may include activities such as repackaging, characterization, and certification that it meets the WIPP waste acceptance criteria. WRAP provides the capability to process and certify some CH TRU waste for shipment to WIPP. However, additional capabilities are needed at Hanford to process and certify RH TRU waste and oversized containers.

Treatment And Processing Facilities

<u>Existing Facilities</u>
- WRAP
- T Plant Complex
- Effluent Treatment Facility
- Commercial Treatment Facilities
- Other DOE sites

<u>New/Modified Facilities</u>
- Modified T Plant Complex
- New M-91 Facility
- Pulse Driers
- Commercial Treatment Facilities

For the purposes of this EIS, treatment facilities include those used to treat MLLW to RCRA standards, as well as those where TRU waste is processed and certified for shipment to WIPP. DOE is currently using a combination of Hanford facilities and offsite facilities to treat MLLW and

TRU waste. The primary existing Hanford treatment facilities for solid waste are WRAP and the T Plant Complex. Commercial facilities have provided treatment capabilities for limited quantities of CH MLLW under two existing contracts. DOE does not currently have facilities for treating most CH MLLW, RH MLLW, or RH TRU waste, nor for treating large containers of MLLW and TRU waste. The ETF provides treatment for leachate from the MLLW trenches.

Proposed new facilities are included in the HSW EIS to provide capabilities for waste treatment and processing that are not currently available at Hanford. Either facilities in the T Plant Complex would be modified, or a new treatment facility would be constructed, to treat some MLLW and TRU waste streams. Existing commercial treatment contracts could also be extended, or new contracts could be established, to treat MLLW. Pulse driers would be used to process leachate from the MLLW trenches after existing treatment facilities at the ETF cease operation.

S.5.3 Solid Waste Disposal

The final step in the waste management process is disposal. Some types of waste can be disposed of safely in existing facilities using conventional methods, such as shallow land burial. Other types of waste require facilities that provide long-term isolation, such as deep geologic disposal.

Hanford disposes of most LLW in LLBGs that consist of a series of trenches. Six LLBGs are located in the 200 West Area, and two are in the 200 East Area. One LLBG in the 200 West Area contains two trenches that are permitted for disposal of MLLW that has been treated to comply with RCRA and state regulations. The MLLW trenches are constructed with a low permeability liner and a system for collecting water that drains through the waste disposal area. The collected liquids, referred to as leachate, are shipped to the ETF and converted to a solid form suitable for disposal.

Disposal Facilities

Existing Facilities
LLBGs
- LLW Trenches
- MLLW Trenches

New/Modified Facilities
LLBGs
- Current Design LLW Trenches
- Enhanced Design LLW Trenches
- Current Design MLLW Trenches
- Enhanced Design MLLW Trench
- Melter Trench
- Closure Caps

After onsite characterization and packaging, DOE plans to send post-1970 TRU waste to the WIPP repository for disposal. Transportation of TRU waste and disposal at WIPP were previously evaluated by DOE (1997b).

In some of the HSW EIS alternatives, new disposal capacity would be constructed for LLW and MLLW. Trenches of a design similar to those currently employed for disposal of LLW and MLLW at Hanford are evaluated, in addition to trenches of enhanced (deeper and wider) design. Separate designs are evaluated for each waste type and for melters from the tank waste treatment facility. In most alternatives, the LLBGs would ultimately be closed by applying a cap consisting of soil, sand, gravel, and asphalt to reduce water infiltration and the potential for intrusion.

S.6 Description of Alternatives

This draft HSW EIS considers a range of reasonable alternatives for managing solid LLW, MLLW, and post-1970 TRU waste at the Hanford Site. An overview of the alternatives for each waste type is presented in the following sections and in Table S.1. In addition to evaluating alternatives for site-specific waste management activities, this draft HSW EIS evaluates a range of waste volumes for MLLW and LLW. Table S.2 shows the volumes of waste that could be managed at Hanford under each of the alternatives. In its final decision, DOE could choose to implement a combination of actions from any of the alternatives evaluated in this EIS.

S.6.1 LLW Alternatives

DOE proposes to manage LLW from Hanford generators and other DOE sites by using existing facilities for waste verification and by constructing additional disposal capacity. DOE needs to determine which treatment, storage, and disposal activities are required for properly managing onsite and offsite solid LLW that currently exists, or that may be received at Hanford in the future. Currently, most LLW is packaged, inspected to determine that it complies with the HSSWAC (FH 2001), and placed in the LLBGs. Limited quantities of waste that do not meet the HSSWAC are currently stored until the waste can be treated to comply with Hanford requirements. DOE needs to evaluate options for permanent disposal of LLW at Hanford, including expansion and possible reconfiguration of disposal facilities to accommodate anticipated waste receipts.

S.6.1.1 LLW Alternative 1 (Preferred Alternative)

As needed, LLW would be inspected and verified at WRAP, the T Plant Complex, or other suitable locations within the Hanford Site. Non-conforming waste would be treated to comply with the HSSWAC using existing onsite capabilities, or if onsite treatment capacity does not exist, it would be treated at an offsite commercial facility. DOE would construct new disposal capacity using a deeper, wider trench design relative to the trenches previously employed for disposal of LLW at Hanford. Disposal would take place within the boundaries of currently defined LLBGs, and the LLBGs would ultimately be closed by applying a cap to reduce water infiltration and the potential for intrusion. This alternative was evaluated for a range of waste volumes that could be managed at Hanford under the WM PEIS ROD for LLW.

S.6.1.2 LLLW Alternative 2

As needed, LLW would be inspected and verified at WRAP, the T Plant Complex, or other suitable locations within the Hanford Site. Non-conforming waste would be treated to comply with the HSSWAC using existing onsite capabilities, or at a new onsite treatment facility. DOE would construct new disposal capacity using a trench design previously employed for disposal of LLW at Hanford. Depending on the volume of waste received at Hanford, expansion of the LLBGs within the 200 Area boundaries may be required. The LLBGs would ultimately be closed by applying a cap to reduce water infiltration and the potential for intrusion. This alternative was evaluated for a range of waste volumes that could be managed at Hanford under the WM PEIS ROD for LLW.

Table S.1. Summary Comparison of Alternatives

	Alternative 1	**Alternative 2**	**No Action**
Low-Level Waste			
Stor age	No indefinite storage needed.	No indefinite storage needed.	Wastes that cannot be treated to HSSWAC would remain in storage in CWC indefinitely.
Treatment	Non-conforming wastes treated commercially. Category 3 (Cat 3) and greater than category 3 (GTC3) LLW emplaced in high-integrity containers (HICs) or in-trench grouted.	Non-conforming wastes treated in a new M-91 Facility. Cat 3 and GTC3 wastes emplaced in HICs or in-trench grouted.	Non-conforming wastes not treated. Cat 3 and GTC3 wastes emplaced in HICs or in-trench grouted.
Disposal	Future LLW trenches would be of the enhanced design. Cap LLBGs at closure.	Future trenches would be of the current design. Cap LLBGs at closure.	Future trenches would be of the current design. No capping of t renches.
Mixed Low-Level Waste			
Storage	No indefinite storage needed.	No indefinite storage needed.	Untreated wastes, including RH wastes and wastes in excess of current disposal capacity, would be indefinitely stored in an expanded CWC.
Treatment	Commercial treatment used for most CH wastes. Modify the T Plant Complex to provide treatment for other MLLW.	Limited commercial treatment. Build new M-91 facility to provide treatment for all other MLLW.	Limited commercial treatment only. Most MLLW remains untreated.
Disposal	Use enhanced design MLLW trenches after filling current trenches. A melter trench would be provided for used vitrification melters. Trenches capped when filled.	Use current MLLW trench design for future trenches. A melter trench would be provided for used vitrification melters. Trenches capped when filled.	Use only existing trenches. Store additional wastes indefinitely. Existing trenches capped when filled.
Post-1970 Transuranic Waste			
Storage	Continued use of CWC and LLBGs. No indefinite storage needed.	Continued use of CWC and LLBGs. No indefinite storage needed.	RH and oversized containers would be stored indefinitely in an expanded CWC.
Processing	Process standard CH wastes in WRAP. Process RH and oversized containers in modified T Plant Complex.	Process standard CH wastes in WRAP. Process RH and oversized containers in new M-91 Facility.	Process standard CH wastes in WRAP. RH and oversized containers would not be processed.
Disposal	Ship all certified wastes to WIPP.	Ship all certified wastes to WIPP.	Ship all certified wastes to WIPP. Some wastes remain untreated.

Table S.2. Waste Volumes Considered in HSW EIS Alternatives

Waste Type	Lower Bound Volume m^3 (ft^3)	Upper Bound Volume m^3 (ft^3)
LLW	432,582 (15,270,000)	631,427 (22,290,000)
MLLW	65,344 (2,307,000)	205,678 (7,260,000)
Post-1970 TRU Waste	45,806 (1,617,000)	
Note: These volumes also include 283,067 m^3 (9,992,000 ft^3) of waste previously disposed of in the LLBGs. For TRU waste, a single waste volume is evaluated representing the maximum Hanford Site forecast.		

S.6.1.3 LLW No Action Alternative

As needed, LLW would be inspected and verified at WRAP, the T Plant Complex, or other suitable locations within the Hanford Site. Non-conforming waste would be treated to comply with the HSSWAC using existing onsite capabilities, or if onsite treatment capacity does not exist, it would be stored indefinitely at the CWC. DOE would construct new disposal capacity using a trench design previously employed for disposal of LLW at Hanford. Disposal would take place within the boundaries of currently defined LLBGs. The trenches would be backfilled to grade, but the LLBGs would not be capped. This alternative was evaluated for the lower bound LLW volume that could be managed at Hanford under the WM PEIS ROD for LLW.

S.6.2 MLLW Alternatives

DOE proposes to treat and dispose of MLLW received from Hanford generators and other DOE sites using existing, expanded, or new facilities. DOE needs to determine which treatment, storage, and disposal activities are required to properly manage onsite and offsite solid MLLW that currently exists, or which may be received at Hanford in the future. The Hanford Site currently has limited treatment capabilities to treat MLLW in compliance with the RCRA Land Disposal Restrictions (LDRs). As a result, most MLLW has been placed in interim storage awaiting final disposition. Existing MLLW disposal facilities at Hanford consist of two engineered trenches permitted under RCRA. The capacity of those trenches is insufficient to dispose of all MLLW that Hanford expects to receive in the future. Therefore, DOE needs to evaluate options for treating Hanford's MLLW in accordance with RCRA and Washington State requirements and for expanding Hanford's MLLW disposal capacity.

S.6.2.1 MLLW Alternative 1 (Preferred Alternative)

MLLW received for storage or treatment would be inspected and verified at WRAP, the T Plant Complex, or other suitable locations within the Hanford Site. However, most verification of treated MLLW is expected to take place at either the generator or treatment facility. DOE would establish contracts with a RCRA-permitted commercial facility (or facilities) to treat most of Hanford's CH MLLW using both thermal and non-thermal processes. For MLLW that cannot be treated by commercial facilities, such as RH or oversized items, DOE would develop new onsite treatment capacity by modifying existing facilities in the T Plant Complex. Limited treatment capabilities that currently exist at WRAP and the T Plant Complex would also continue to be used.

DOE would fill two existing MLLW trenches at Hanford and then construct new disposal units of a deeper and wider design. Disposal would take place within the boundaries of currently defined LLBGs, and the trenches would be closed by applying a RCRA-compliant cap. This alternative was evaluated for a range of waste volumes that could be managed at Hanford under the WM PEIS ROD for MLLW.

S.6.2.2 MLLW Alternative 2

As needed, MLLW received for storage or treatment would be inspected and verified at WRAP, the T Plant Complex, or other suitable locations within the Hanford Site. However, most verification of treated MLLW is expected to take place at either the generator or treatment facility. Under this alternative, DOE would limit commercial treatment of CH MLLW to quantities specified in existing contracts and develop new onsite capabilities to treat most CH MLLW, RH MLLW, and oversized items by constructing a new treatment facility. Limited treatment capabilities that currently exist at WRAP and the T Plant Complex would also continue to be used.

DOE would fill two existing MLLW trenches at Hanford and then construct new disposal trenches of a similar design. A separate trench would be constructed for disposal of melters from the tank waste treatment plant. Disposal would take place within the boundaries of currently defined LLBGs, and the trenches would be closed by applying a RCRA-compliant cap. This alternative was evaluated for a range of waste volumes that could be managed at Hanford under the WM PEIS ROD for MLLW.

S.6.2.3 MLLW No Action Alternative

As needed, MLLW received for storage or treatment would be inspected and verified at WRAP, the T Plant Complex, or other suitable locations within the Hanford Site. However, most verification of treated MLLW is expected to take place at either the generator or treatment facility. DOE would treat CH MLLW, up to minimum quantities specified in existing contracts, at a RCRA-permitted commercial facility. Limited treatment capabilities that currently exist at WRAP and the T Plant Complex would also continue to be used.

DOE would fill two existing MLLW trenches at Hanford, and the trenches would be closed by applying a RCRA-compliant cap. Waste in excess of existing treatment and disposal capacity would be stored indefinitely at the T Plant Complex or at the CWC, which would be expanded as necessary. This alternative was evaluated for the lower bound MLLW volume that could be managed at Hanford under the WM PEIS ROD for MLLW.

S.6.3 TRU Waste Alternatives

DOE proposes to expand Hanford Site capabilities for storage, processing, and certification of TRU waste for disposal at WIPP. DOE needs to determine which processing, certification, and storage activities are required to properly manage post-1970 TRU waste that currently exists, or which may be received at the Hanford Site in the future. Since 1970, DOE has retrievably stored TRU waste at the Hanford LLBGs in trenches and caissons, and in aboveground facilities. DOE previously decided to dispose of this inventory of TRU waste and future generated TRU waste at the WIPP. WRAP currently has the capability to process and certify some types of TRU waste for disposal at WIPP. To meet WIPP waste acceptance criteria for all types of TRU waste, additional processing and certification capabilities must be developed and implemented at the Hanford Site.

S.6.3.1 TRU Waste Alternative 1 (Preferred Alternative)

DOE would continue to store post-1970 TRU waste awaiting processing at CWC, the T Plant Complex, and the LLBGs (for waste previously placed into retrievable storage in trenches and caissons). CH TRU waste in standard containers (drums and standard waste boxes) would continue to be processed and certified at WRAP for disposal at WIPP. For TRU waste that could not be processed at WRAP (primarily oversized packages and RH waste), onsite capabilities for processing and certification would be developed by modifying existing facilities in the T Plant Complex. Future TRU waste receipts, waste stored in surface facilities, and post-1970 TRU waste that had been retrievably stored in the LLBG trenches and caissons would be processed and shipped to WIPP. This alternative was evaluated using the maximum TRU waste volume forecast for management at Hanford.

S.6.3.2 TRU Waste Alternative 2

DOE would continue to store post-1970 TRU waste awaiting processing at CWC, the T Plant Complex, and the LLBGs (for waste previously placed into retrievable storage in trenches and caissons). CH TRU waste in standard containers (drums and standard waste boxes) would continue to be processed and certified at WRAP for disposal at WIPP. For TRU waste that could not be processed at WRAP (primarily oversized packages and RH waste), onsite capabilities for processing and certification would be developed by constructing a new facility. Future TRU waste receipts, waste stored in surface facilities, and post-1970 TRU waste that had been retrievably stored in the LLBG trenches and caissons would be processed and shipped to WIPP. This alternative was evaluated using the maximum TRU waste volume forecast for management at Hanford.

S.6.3.3 TRU Waste No Action Alternative

DOE would continue to store post-1970 TRU waste awaiting processing at CWC, the T Plant Complex, and the LLBGs (for waste previously placed into retrievable storage in trenches and caissons). CH TRU waste in standard containers (drums and standard waste boxes) would continue to be processed and certified at WRAP for disposal at WIPP. For TRU waste that could not be processed at WRAP (oversized packages, RH waste, and some miscellaneous waste streams), no onsite processing capability would be available. To the extent possible, future TRU waste receipts, waste stored in surface facilities, and post-1970 TRU waste that had been retrievably stored in the LLBG trenches and caissons would be processed at WRAP and shipped to WIPP. Waste that could not be processed and certified for disposal at WIPP would be stored indefinitely at the T Plant Complex or at CWC, which would be expanded as necessary. This alternative was evaluated using the maximum TRU waste volume forecast for management at Hanford.

S.6.3.4 Preferred Alternative

Based on the results of the environmental consequences analyses, in addition to cost and other considerations, DOE has identified a preferred alternative for the HSW EIS. At this time, the DOE preferred alternative consists of LLW Alternative 1, MLLW Alternative 1, and post-1970 TRU waste Alternative 1, as described in the preceding sections. In general, these three alternatives provide the most cost-effective and environmentally preferable approach to waste management at Hanford for the range of waste volumes that might be managed at the Site as a result of WM PEIS decisions. However, DOE will consider all comments received during the public comment period for this draft EIS before preparing the final EIS and publishing a ROD regarding Hanford solid waste program operations.

S.7 Affected Environment

The DOE Hanford Site lies within the semiarid Pasco Basin of the Columbia Plateau in southeastern Washington State (Figure S.4). The Site occupies an area of about 1517 km^2 (586 mi^2) north of the confluence of the Yakima River with the Columbia River. The major portion of the Hanford Site is undisturbed and provides a buffer for the relatively small areas used for nuclear materials storage, waste storage, and waste disposal. Only about 6 percent of the land area on the Site has been disturbed and actively used.

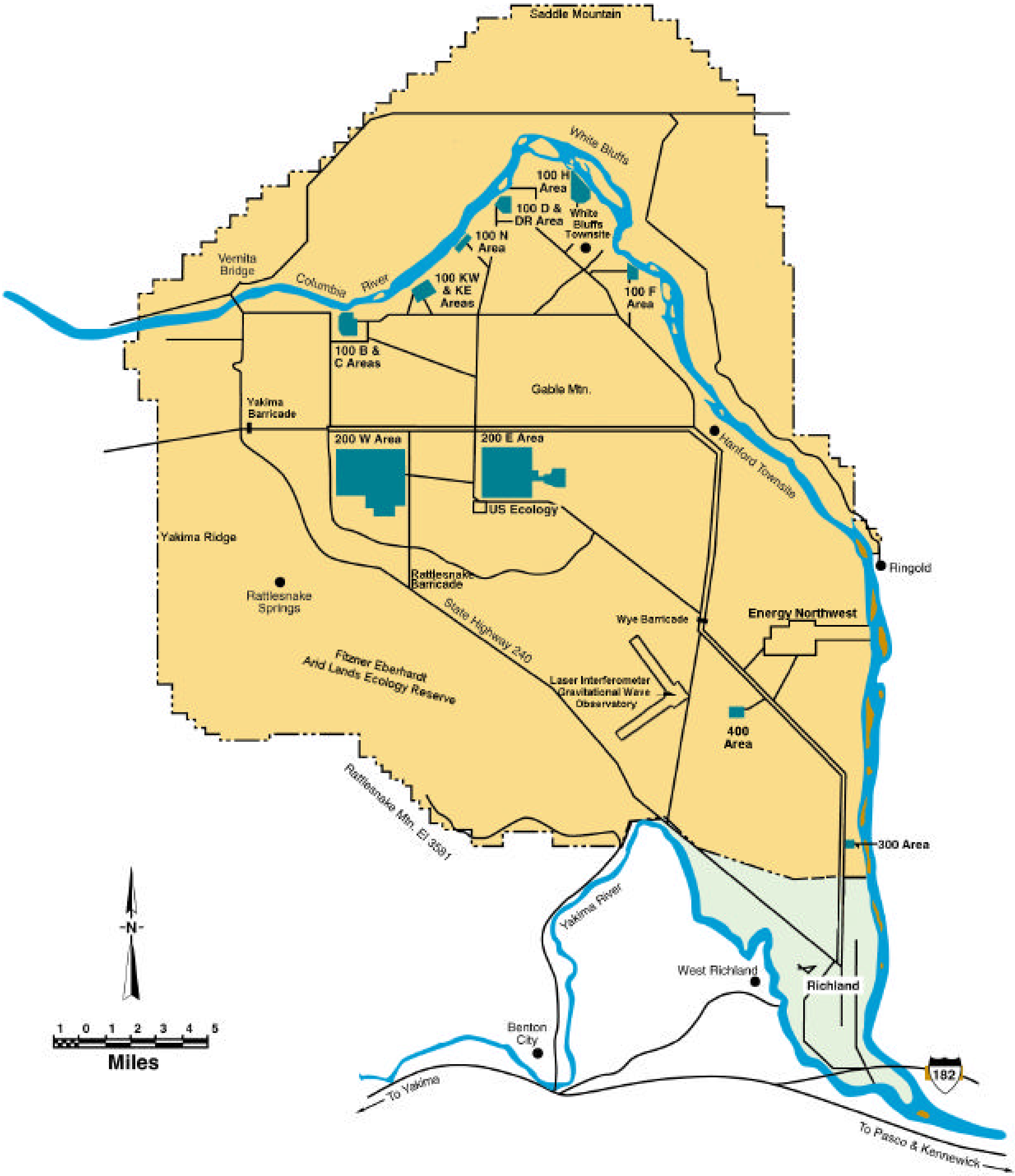

Figure S.4. U.S. Department of Energy – Hanford Site (after Neitzel 2001)

Most of the activities described and analyzed in the HSW EIS would occur within the existing boundaries of the Hanford Site 200 Areas. The 200 East and 200 West Areas occupy 51 km^2 (19.5 mi^2) in the 200 Area Plateau of the Hanford Site, about 8 to 11 km (5 to 7 mi) south of the Columbia River. Facilities located in the 200 Area Plateau were built to process irradiated fuel from the production reactors. The operation of these facilities resulted in the need for treatment, storage, and disposal facilities for radioactive and hazardous wastes. The WRAP, CWC, LLBGs, the MLLW trenches, TRU waste caissons and trenches, and the T Plant Complex are located in the 200 Areas. Unplanned releases of radioactive and non-radioactive waste have contaminated some parts of the 200 Areas. The Environmental Restoration Disposal Facility (ERDF) for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, 42 USC 9601) cleanup wastes is located in the 200 Area Plateau. Other federal agencies, such as the Department of the Navy, also use Hanford nuclear waste treatment, storage, or disposal facilities. Institutional controls are expected for CERCLA remediation areas in the 200 Area Plateau.

Archeological records show past Native American occupation and use of the Hanford area for hundreds of years. After Americans of European descent arrived, use of the area by indigenous peoples was curtailed, but not eliminated. In the Treaties of 1855, the Yakama Nation and the Confederated Tribes of the Umatilla Indian Reservation ceded land, including the present Hanford Site, to the United States.

Natural and cultural resource values at the Hanford Site include protection of the Columbia River, protection of the last remnant of mature sagebrush steppe in Washington State, protection of groundwater from further degradation, and restoration of groundwater quality to usable levels. The Hanford Site may also provide habitat for several federal or state threatened and endangered species, including the bald eagle, ferruginous hawk, and spring-run chinook salmon.

The Hanford Reach National Monument was created on June 9, 2000, to protect sensitive habitats and resources on the Hanford Site. The monument includes 79,253 ha (195,843 ac) of federally owned land making up a portion of the Hanford Site. The principal components of the monument are the Fitzner/Eberhardt Arid Lands Ecology Reserve (ALE), the McGee Ranch and Riverlands area, the Saddle Mountain National Wildlife Refuge, land along the south and west sides of the Columbia River corridor, the federally owned islands within the portion of the Columbia River included in the monument, and the Hanford sand dune field. The components of the monument are managed by the U.S. Fish and Wildlife Service and by DOE, in consultation with the Department of the Interior. In June 2000, a wildfire burned approximately 80,000 ha (200,000 ac) of the Hanford Site and the surrounding area, including parts of the newly designated monument.

S.8 Environmental Consequences

The HSW EIS examines the potential consequences to environmental resources of implementing the alternatives through completion of most waste management operations. For some consequences, such as long-term effects of waste disposal on groundwater and the Columbia River, the evaluation period extends well beyond the end of the site operations. For most resources, little or no impact would occur as a result of implementing any of the alternatives. For some resources, differences in impacts among the alternatives would exist. These differences are described in the following sections. Table S.3 provides a summary of the potential environmental consequences for selected resource areas under the three alternatives.

S.8.1 Land Use

Long-term commitment of land for waste disposal ranges from 146 ha (361 ac) of land within the 200 Areas under Alternative 1 (lower bound volume), to 178 ha (440 ac) under Alternative 2 (upper bound volume). In all cases, total land use for solid waste operations, including treatment and storage facilities, would represent less than 7 percent of the 200 Area Industrial-Exclusive zone. Land use described in the No Action Alternative includes land that would be needed for expansion of CWC to indefinitely store MLLW and TRU waste that could not be treated or disposed of, but it does not include land that would be needed at Hanford, or at another site, after 2046 to treat and dispose of those wastes. Under the other alternatives, CWC would not be expanded beyond its current footprint, although Alternative 2 would require additional land within the 200 Areas for constructing a new facility to treat MLLW and TRU waste.

S.8.2 Transportation

The principal difference in environmental consequences between the alternatives would be a result of the waste volumes managed under each and the particular activities included. With the exception of MLLW Alternative 1, transportation analysis in the HSW EIS considers only shipment of waste within the Hanford Site. The WM PEIS evaluated the shipment of waste between DOE sites for several alternatives in which the Hanford Site would receive varying quantities of waste from offsite generators. Under MLLW Alternative 1, some MLLW would be shipped from Hanford to an offsite treatment facility and returned to Hanford for disposal. As a bounding case, a treatment facility in Oak Ridge, Tennessee, was assumed for purposes of the transportation analysis. Transportation of waste was determined to result in up to four fatalities.

S.8.3 Human Health

Health impacts were estimated from radionuclides and chemicals that could eventually leach from waste disposed at the Hanford Site and reach groundwater that in time would drain into the Columbia River. Under all of the alternatives, radioactive or hazardous chemical exposures to populations using Columbia River water downstream from the Hanford Site would be well below those from which any health effects would be expected. Airborne emissions from routine operations would likewise not result in additional latent cancer fatalities (LCFs) in the exposed population.

Neither occupational radiation exposure nor occupational injuries would be expected to result in fatalities among workers involved in the waste management operations, although some lost workday accidents would be expected based on Hanford Site labor statistics (Table S.3). The impacts of accidents vary greatly depending on the circumstances of the events analyzed. The highest consequence event involving waste management facilities considered in this EIS was a beyond design basis earthquake at CWC. That accident could result in up to 28 LCFs in the population within a 80 km (50 mi) radius, if the event occurred.

Table S.3. Summary Comparison of Impacts Among the Alternatives

Consequence Category	Alternative 1[a]	Alternative 2[a]	No Action Alternative
Land committed to disposal, ha	146-153	162-178	149
Potential habitat disturbance, ha[b]	76-86	107-133	86
Potential for impacts on Threatened and Endangered species	Negligible	Negligible	Negligible
Potential for impacts on cultural resources	Low	Low	Low
Socioeconomic impacts:			
Total labor, worker-years	15,600-16,300	15,800-16,600	20,600
Potential for impacts on Community	Low	Low	Low
Consumption of non-renewable resources:			
Diesel fuel, m^3	22,000-36,000	27,000-42,000	2400
Gasoline, m^3	170-280	290-400	80
Propane, m^3	16,000-16,000	19,000-22,000	1600
Maximum percentage of air quality limits	18 (SO_2)	18 (SO_2)	25 (PM_{10})
Maximum concentration of a nuclide as percentage of Drinking Water Standards:[c]			
Well 1-km from waste site (yr post-closure)	110 (1200)	110 (1200)	180 (1100)
Near river well	2.1 (1800)	3.5 (1800)	4.6 (1500)
Average in Columbia River water	0.0003	0.0005	0.0007
Health impacts (latent cancer fatalities [LCFs]) on public:			
Via air – routine radiological releases	None	None	None
Via air – routine chemical releases	None	None	None
Via groundwater, LCFs among Tri-Cities population over 10,000 years	None	None	None
Bounding Accident (Earthquake), LCFs in 80-km (50-mi) population	Up to 28 (all alternatives)		
Health impacts on workers:			
Industrial accidents, lost workdays	6100-6300	6200-6400	8000
Routine Operations, LCFs	None	None	None
Radiological accidents, individual probability of LCF if event occurs	1	1	1
Transportation of waste and materials:			
Crew – radiological – incident free, LCFs	1[d]	None	None
Public – radiological – incident free, LCFs	None	None	None
Public – non-radiological accident fatalities	1	None	None
Public – hydrocarbon emissions, LCFs	1 - 2	1	1

(a) Where a range of values is presented, they represent the consequences of managing the lower and upper bound waste volumes, respectively.
(b) Provided that habitat destroyed by the June 2000 range fire in the facility expansion area is re-established before facility expansion would be needed.
(c) Drinking Water Standards (DWSs) are not applicable at these locations, but are used as benchmarks for water quality impacts.
(d) Attributable principally to transport of some MLLW offsite for treatment and return for disposal.

S.8.4 Costs

Projected Costs (through year 2046)
Alternative 1: $3.0 to 3.3 billion
Alternative 2: $3.2 to 3.5 billion
No Action Alternative: $2.8 billion

The cost of implementing the HSW EIS alternatives ranges from $2.8 billion to $3.5 billion. The No Action Alternative corresponds to the lowest cost, but does not provide for final disposal of many waste streams that are ultimately disposed of in the other alternatives. Therefore, the No Action Alternative would entail deferred costs for eventual treatment and disposal of stored wastes that are not reflected in this estimate. Costs for Alternative 1 are marginally higher than for the No Action Alternative, and range from $3.0 to 3.3 billion, depending on the total volume of waste managed. However, this alternative would provide for eventual treatment and disposal of all waste streams evaluated in the HSW EIS. Alternative 2 would also provide for treatment and disposal of all waste streams, but involves a somewhat higher cost ($3.2 to 3.5 billion) because of additional facilities that would be constructed at Hanford.

S.8.5 Cumulative Impacts

Impacts for all resources considered in the HSW EIS are relatively small and would not be expected to contribute substantially to cumulative impacts of other activities at Hanford or in the surrounding region.

S.8.6 Mitigation

DOE has identified measures the agency could take to avoid or reduce environmental impacts that might occur as a result of the Hanford solid waste program. For example, to avoid loss of cultural resources, DOE would conduct cultural resource surveys before constructing solid waste management facilities. If any resources were discovered during construction, construction activities would be stopped until the find could be evaluated and its appropriate management determined. In addition, if mature sagebrush steppe habitat needs to be removed to construct a solid waste management facility, the habitat loss could be compensated by revegetating or protecting other parcels of land as agreed upon by DOE and regulatory agencies.

S.9 Public Involvement

DOE encourages public comments on this draft HSW EIS. Comments may be submitted at a public meeting (the time and place of such meetings will be announced in local media and in the Federal Register in advance) or by mail, fax, or email as noted below. DOE will consider all comments received during the designated comment period for this draft HSW EIS in the preparation of a final HSW EIS. Comments received after the end of the public comment period will be considered to the extent practicable. The final document will include responses to the comments received.

No sooner than 30 days following the issuance of the final HSW EIS, DOE will issue a ROD that announces the substance of the decision, describes the alternatives considered by the agency in reaching its decision, and specifies the alternative(s) that were considered to be environmentally preferable. DOE will also identify and discuss any additional factors that were used in making its decision. Finally, DOE will describe any mitigating actions proposed to avoid or minimize adverse environmental consequences from the alternative selected.

Following the issuance of the ROD, if required, DOE will prepare a Mitigation Action Plan that addresses the mitigation commitments made in its decision. The Mitigation Action Plan would explain how mitigation measures committed to in the decision are designed to mitigate adverse environmental impacts associated with the DOE course of action.

Comments on this draft HSW EIS may be submitted as follows:

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S.10 References

10 CFR 1021. "National Environmental Policy Act Implementing Procedures." *U.S. Code of Federal Regulation*s, as amended.

40 CFR 191. "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-level and Transuranic Radioactive Wastes." *U.S. Code of Federal Regulation*s.

40 CFR 1500-1508. Council on Environmental Quality, "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act." *U.S. Code of Federal Regulation*s, as amended.

42 USC 2011 *et seq*., Atomic Energy Act (AEA) of 1954.

42 USC 4321 *et seq*., National Environmental Policy Act (NEPA) of 1969, as amended.

42 USC 6901 *et seq*., Resource Conservation and Recovery Act (RCRA) of 1976.

42 USC 9601, Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980.

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